

THE NEW BASEL CAPITAL ACCORD: POTENTIAL EFFECTS ON LENDING RATES IN NEW ZEALAND

Kurt Hess¹

Senior Fellow

University of Waikato

Waikato Management School, Department of Finance

Keywords:

Basel II, Lending Rates, Modigliani Miller

¹ Contact details: Kurt Hess, University of Waikato, WMS Department of Finance, Private Bag 3105, Hamilton, New Zealand, ph. +64 7 838 4196, kurthess@waikato.ac.nz

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ABSTRACT

This article focuses on potential effects of the new Basel II Capital Accord on lending rates in New Zealand. Lending rates might be affected by both revised asset risk weightings and alternative methods for determining minimum capital requirements. Media commentators have thus often expressed the concern that loans to certain sectors like SMEs could become prohibitively costly while others, like the residential mortgage sector could benefit. Based on ideas first formulated by Modigliani & Miller (1958), it is argued the new regime will help move the banking system to a more risk based loan pricing away from traditional loan cost calculation schemes which erroneously still assume fixed cost of capital charges. This in turn will lead to lending rates more in line with the true risk of the underlying credit and mitigate some of the effects of the new regulatory regime, in particular the modified risk weights.

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INTRODUCTION

The new regulatory framework of the Basel Capital Accord is about to bring a most fundamental change to the way regulators around the globe assess will the risk of financial institutions. It is also called “Basel II” as it will supersede an older Basel I accord which had been in force since 1988. While the current Basel I accord mainly deals with the minimum capital the banks are required to hold in order to safeguard their liabilities, the new accord takes a more holistic view on what constitutes risk in that it will introduce most comprehensive rules for regulatory capital and risk management. Its final shape is to be finalized in 2004 and after adoption by the national prudential authorities will become effective starting 2006.

After the new Basel II rules have been in the working for well over five years, it comes as no surprise that these proposals have been extensively analysed and researched by regulatory bodies, the banking industry and academia alike. The most comprehensive survey was the so-called quantitative impact study with the participation of more than 350 banks in 43 countries (Basel Committee on Banking Supervision, 2003, May). This exercise primarily tried to assess the change in capital requirements under the new rules. Academic research, for the most part also sponsored by bank prudential agencies, has been very broad. Topics include possible systemic impacts like the suspected procyclicality of the new regulation which is explored in Borio et al. (2001) or Allen & Saunders (2002). Academic journals like the *Journal of Financial Intermediation* edited by von Thadden (April 2004) or the *Journal of Banking and Finance* edited by Jackson & Perraudin (May 2002) have compiled special issues on the subject where well-known researchers like Altman et. al (2002) present their views by means of sophisticated models and empirical studies.

In all this flood of mostly quantitative research, one less tangible aspect has not been further explored in the academic literature though it has found some attention in the media. This is the question how the new regulatory regime will impact the relative lending cost to various sectors of the economy. The financial press and practitioners magazines have often focused on the small to medium

sized enterprises (SME) which supposedly could find it more costly to get loans². In New Zealand, commentators like Brian Gaynor (2003) have argued that with Basel II banks will have a greater incentive to lend to the residential housing market, thus fuelling the housing boom even further.

This paper will take a more general view but uses the sector of residential mortgage lending, the most important loan segment for New Zealand banks (see Figure 1), as an example to review the potential effects of Basel II. It argues that the new risk sensitive framework will bring the pricing of loans more in line with particular loss expectation, away from mechanistic pricing schemes often used under Basel I and, as above media report illustrate, still deeply ingrained in the thinking of many market observers. In contradiction to standard theories first formulated by Modigliani & Miller (1958), these assume fixed capital charges on capital required under the rules and do not necessarily reflect the true risk of the credit. In other words, the current Basel I rules prescribe a predetermined percentage of capital for each type of loan so banks will sometimes derive the particular lending rate from the weighted average of deposit and capital funding costs, with the weight of the capital given by the regulatory requirements. If the banks were to adhere to this pricing method, higher minimum capital requirements under Basel II would indeed flow immediately into higher lending cost and vice versa. While this is the scenario many media commentators base their conclusions on, they forget that in future the capital required ideally will reflect the actual risk of the credit. This means it is not the new rules per se that will affect the lending rates but the revised assessment of risk that will do this.

The paper develops this argument as follows. The next section provides some background information on the current Basel and new Basel II Capital Accord. Section 3 develops and discusses a numerical example of how banks traditionally have priced their loans and how this may lead to erroneous results in the Modigliani & Miller world. Section 4 concludes.

² For example, Wilcox (2003) argues that SMEs will find it more costly to raise bank debt than their larger counterparts with official credit ratings. This line of argument is reflected in many other media reports.

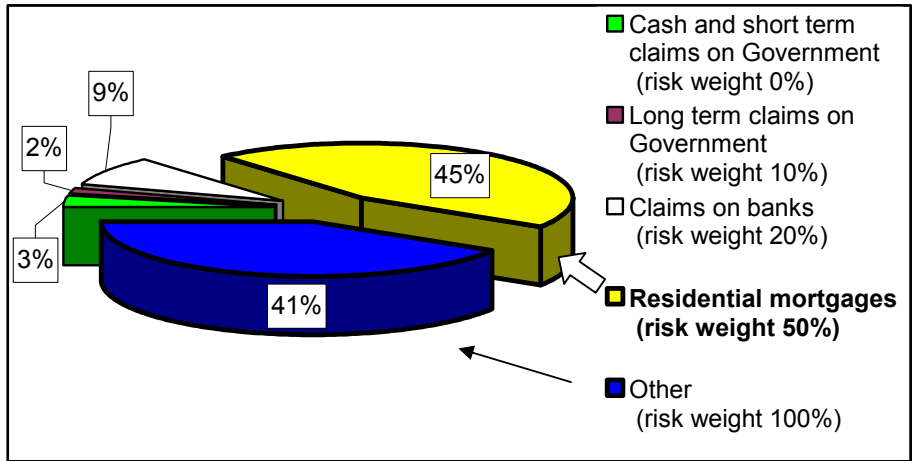


Figure 1: New Zealand Major Banks: Assets in Basel I Risk Categories

Source: Bank disclosure statements 2003 of ANZ, ASB, BNZ, and NBNZ; excludes Westpac which reports capital adequacy at a parent level only.

BACKGROUND INFORMATION ON CAPITAL ADEQUACY RULES

Current Basel Capital Accord (Basel I)

Regulation of the banking system has been an issue ever since such institutions started playing their important role in the modern industrialised economy. This because the failure of a large banking institution generally has much wider ramifications than the bankruptcy of a company in another industry sector. In this context, capital adequacy rules prescribing a certain minimum equity backing for the lending portfolio have often been included as an element of regulation. While in earlier times the rules were based on the pure solvency ratios³, the 1988 Basel Accord (see Basel Committee on Banking Supervision, 1988) provided a truly innovative approach in this respect.

The idea of Basel I is to mandate banks to hold not only a safety cushion in order to ensure solvency but banks holding riskier assets must hold more capital as they have a higher probability of failure. To link the required capital to the riskiness of bank assets, the accord assigns assets to one of five buckets. This is illustrated in Figure 1 for the universe of major New Zealand banks. Figure 2 then illustrates with a numerical example how each asset category is weighted to derive the so-called

risk weighted assets. There is a similar procedure for off-balance sheet exposures (not shown) to find a total amount of risk-weighted credit exposure for the bank.

On-balance sheet exposures	Principal Amount \$m	Risk Weight %	Risk Weighted \$m
Cash and short term claims on Government	660	0	0
Long term claims on Government	873	10	87
Claims on banks	2,650	20	530
Residential mortgages	12,062	50	6,031
Other	12,015	100	12,015
Total on-balance sheet exposures	28,260		18,663

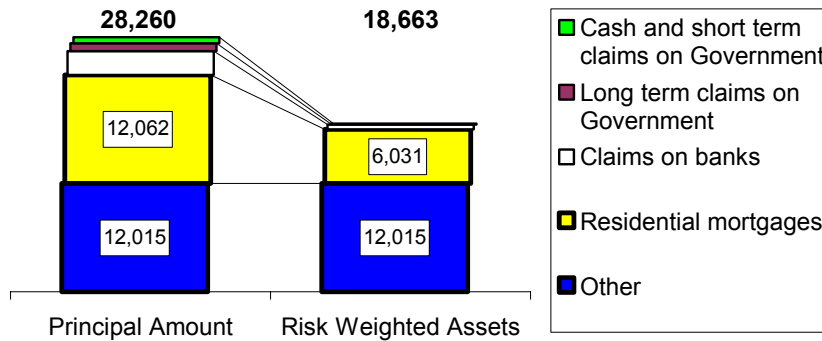


Figure 2: Example Calculation of Risk Weighted Assets
[ANZ Bank (NZ Operations) year per 30/9/2003]

The next step is the determination of the bank's capital. In broad terms, capital is broken down into two elements. Tier 1 capital essentially consists of the ordinary and preferred share capital issued by the bank while tier 2 would typically be subordinated loan funds which rank behind the bank's general deposit liabilities. In the case of the large New Zealand banks, such subordinated funds are often borrowed from the overseas parent paying a rate of between 1.5 and 2% in excess of regular bank term deposits.

Finally, Basel I rules prescribe so-called minimum capital adequacy ratios. Firstly, tier 1 capital must be at least 4% of risk weighted credit exposures and, secondly, combined tier 1 and 2 to credit

³ The solvency ratio is derived by taking a bank's equity capital and dividing it by total assets.

exposures must exceed 8%. These ratios are fairly standard⁴ around the globe and also apply to New Zealand registered banks.

The New Basel Capital Accord (Basel II)

As indicated in the introduction, the new Basel Capital Accord (Basel II) will soon be the basis for bank regulation around the globe. Presenting the contents of the new accord in a nutshell is not an easy task. In its third draft version published in 2003⁵, the document has 216 pages which compares to the 30 pages of the original accord of 1988. While Basel I rules mainly deal with the minimum capital the banks are required to hold in order to safeguard their liabilities, the Basel II regulatory framework is much more comprehensive and is based on a so-called three pillar concept:

- Pillar 1: Minimum capital requirements
- Pillar 2: A supervisory review process
- Pillar 3: Market discipline (risk disclosure)

The first pillar refines and expands the capital adequacy rules of the existing Basel I. The fact that it makes up more than 80% of the draft text (179 of 216 pages) is a reflection of weaknesses of Basel I that have become evident over the past few years. Given that the risk weighting categories under Basel I are rather crude and often do not match the actual risks, banks started engaging in what is sometimes termed “regulatory arbitrage”. They disposed of loans for which Basel I requires more capital, e.g. through asset securitizations, while generally retaining subordinated and residual tranches

⁴ Some countries opted to prescribe different ratios. Japan requires 4% tier I +II ratio for pure domestic banks.

⁵ see Basel Committee on Banking Supervision (2003, April)

on their own books⁶. Even though such transactions reduce the capital requirements and thus improve capital adequacy ratios, the credit risk is in essence retained by the originating institution. Accordingly, capital adequacy under the first pillar foresees much finer categories under the so-called standardized approach (see Table 1) whilst the ratio requirements of 4%, respectively 8% remain unchanged. Beyond this, banks can also opt for an internal rating based approach (IRB) instead of the standardized approach where they estimate their own risk measures like probability of default which then become the basis for regulatory capital calculations. As a final note, pillar one also introduces capital requirements for operational risk which again can be determined by either a standardized or an advanced measurement approach.

The second and third pillars address more qualitative regulatory aspects. Pillar two defines the supervisory review process, which sets some basic standards for bank supervision to minimise regulatory arbitrage outlined above. Simply speaking, the second pillar states that where regulators conclude that capital, as determined through the processes of pillar one, is inadequate, they can simply mandate higher requirements. Lastly, pillar three stresses the importance of market discipline and invites national regulators to set standards for good disclosure, in particular on the banks' risk exposures.

There are still uncertainties with regard to the actual implementation of Basel II in a New Zealand context. In New Zealand, it is the Reserve Bank (RBNZ) which is in charge of prudential regulation and supervision of the banking sector. RBNZ has indicated that it prefers banks to apply the simple standardized approach under Basel II with weights as shown in Table 1 (see RBNZ, 2003). This is in line with its traditional philosophy of promoting good risk disclosure but of interfering in only limited ways into the affairs of banks (as it would certainly be required under pillar two if a bank chose an IRB rating approach). On the other hand, the major players in the New Zealand banking sector are all Australian owned and there is obviously an interest to coordinate the approach with the

⁶ Securitization are rather small scale in New Zealand but a large market has developed in the US and Europe. In recent years, Australia has seen a rise in asset backed securities issues (see Williams, 2004).

Australian Prudential Regulation Authority (APRA)⁷. For the purpose of this article, which explores the impact on lending rates in general terms, these implementation issues should nonetheless not fundamentally affect the conclusions.

Exposure Category	Basel I	Basel II
Cash, short-term claims on NZ government and RBNZ	0%	0%
Claims on NZ government with maturities more than one year	10%	10%
Claims on NZ banks and local authorities	20%	20 to 100% depending on credit rating
Loans to rated companies (corporates)	100%	
AA- to AA		20%
A- to A+		50%
BB- to BBB+		100%
Less than BB-		150%
Unrated		100%
Loans collateralised with residential real estate	50%	35%
Retail type lending (e.g. credit cards, small business loans)	100%	75%
Past due loans w/o proper provisions	100%	150%
Residual and low-rated tranches retained in asset securitizations	100%	350% and more

Table 1: Comparison of Selected Risk Weightings of Original vs. New Basel Capital Accord

The table shows selected risk categories relevant for a New Zealand based bank with Basel II weightings shown under the standardized approach. Loans are always considered long-term unless stated otherwise.

Source: Basel Committee on Banking Supervision (2003, April)

⁷ Regulators on both side of the Tasman have formed a working party to study the integration regulatory frameworks between in Australia and New Zealand. See RBNZ (2004)

LOAN PRICING WITH CHANGED RISK WEIGHTS

As shown in Table 1, risk weights will change for most loan categories under the New Accord. If one takes the residential mortgage lending as an example, what would thus be the impact on the rate charged by banks for such a mortgage loan? A first glance, there seems to be a straightforward answer. If there is a lower risk weight, banks require less “costly” equity to support it and loans should thus be priced more favourably. This is best shown with a numerical example in the following loan pricing scheme (Table 2) as it is often used by banks. The costing is based on a residential mortgage loan with current 50% risk weighting. For the risk weighting of 35% as proposed under Basel II, one would find a lower capital charge of 0.45% instead of 0.64% which then lowers the loan price from 5.84% to 5.65%.

Bank Deposit Funding Cost	4.00%	Average costs of deposits & non-capital funding sources
Risk premium for expected losses	0.50%	To compensate for expected credit losses
Credit administration	0.70%	To pay for the bank’s operational expenses
Total pre-capital charge price	<u>5.20%</u>	
Capital charge	<u>0.64%</u>	From below: \$0.64 as a percentage of a \$100 loan
Total post-capital charge loan price	<u><u>5.84%</u></u>	Pre-capital charge price plus capital charge
Calculation of Capital Charge		
Minimum capital adequacy ratio	8%	Minimum capital adequacy ratio for tier 1 & 2 capital
Risk weight	50%	for residential mortgages under Basel I
Capital required per \$100 of loan	\$4.00	
Cost of capital	20%	Assumption on average return demanded by the bank’s capital investors
Excess over bank funding costs (%)	16%	= 20% minus 4%
Excess over bank funding costs (\$)	\$0.64	= 16% of \$4.00

Table 2: Example of Traditional Loan Pricing Scheme

A more critical analysis of this pricing scheme reveals, however, that it is actually flawed as it assumes the cost of capital does not change if the risk weights are changed. It is easy to see that

fundamentally the credit risk of a mortgage loan portfolio will not change if we change the way it is funded. What changes, or in this case increases, is the risk to the capital holders if we decrease the amount of tier 1 and 2 capital held against the loan. This should then be reflected in a higher required return by the contributors of a bank's capital.

This concept in corporate finance is not new and has first been expressed by Nobel laureates Modigliani & Miller (1958). It is presented in even the most elementary finance textbook as "M&M Proposition I and II"⁸. In particular, proposition II states that the risk to equity holders rises with leverage which implies that a bank's shareholder require a higher return on the small equity portion of a highly leveraged loan and conversely, they are willing to accept a lower rate if they bear less risk. Accordingly, the loan risk characteristics and not the capital required should be the determinant of the loan rate.

This last point is illustrated in the visualization in Figure 3 which extends the numerical example of Table 2. The starting point is an assumption on the expected shape of the loan loss distribution (chart top right corner). The calculation scheme in Table 2 assumed that the bank on average expects to lose 0.5% of its loan portfolio but there is obviously a range of potential outcomes. In some years, the loss rate is lower, in other year higher. For this example, we presume that the bank wishes to price its loans on "unexpected losses at a 90% confidence level"⁹ which means it sets the risk premium such that it can expect to make a profit in 9 out of 10 years. This threshold in the example distribution of Figure 3 is 0.8%. In addition to the expected loss of 0.5% it will thus add a risk margin for unexpected losses of 0.3% to its gross funding costs of 4.7% and charge 5.5% for the loan.

⁸ e.g. in Ross, Westerfield, & Jaffe (1999, p. 368 - 380)

⁹ Assume the distribution has been derived from the bank's loss experience. For this hypothetical example, it was modeled as a discrete Poisson distribution for 200 loans with a probability of default 2.5% (intensity = 5) and loss given default of 20%.

Returning to the concepts of M&M Proposition II, the weighted average cost of capital is constant and given by

$$r_{WACC} = \frac{B}{B+E}r_B + \frac{E}{B+E}r_E \quad \Rightarrow \quad r_E = r_{WACC} + \frac{B}{E}(r_{WACC} - r_B) \quad (1)$$

where

B is the amount of funds obtained from bank deposits, E the amount of equity capital, r_B and r_E are the required return on the deposits, respectively equity capital.

Proposition II as it is usually expressed in (1) thus implies that the required return on equity is a linear function of the deposit funding to capital funding ratio. In the charts in Figure 3, cost of equity is shown as a function of leverage l defined as the percentage of the loan funded through deposits:

$$r_E = \frac{r_{WACC} - lr_B}{(1-l)}r_B \quad \text{with } l = \frac{B}{B+E} \quad (2)$$

The bottom left chart in Figure 3 shows cost of equity over the whole 0-100% leverage range with r_E becoming infinitely large as l approaches 100%. The top left chart and bottom right chart zoom into the full range chart at the short, respectively the long end. The short end visualizes the risk premium for expected and unexpected risk added to the cost of funding. The long end chart details the effect of increasing leverage from a Basel I to the Basel II funding level under the standardized approach. It demonstrates the sensitivity of required return on equity for such levered financing when r_E increases from 24.7% with 96% leverage to 33.3% with the Basel II leverage of 97.2%, i.e. a rise of more than 30%.

We conclude that in a Modigliani & Miller world there is clearly no reason to charge less for a residential mortgage loan just because the required capital has been reduced. It is no question that Modigliani & Miller's theories are based on rather crude assumptions of "perfect and frictionless" capital markets. So it presumes that investors could attain any degree of leverage on their own. This might be a realistic proposition for non-financial firms but difficult for highly levered financial

institution. Having said this, the logic of Modigliani & Miller (1958) is now widely accepted as a benchmark even though research into optimal funding strategies is ongoing¹⁰.

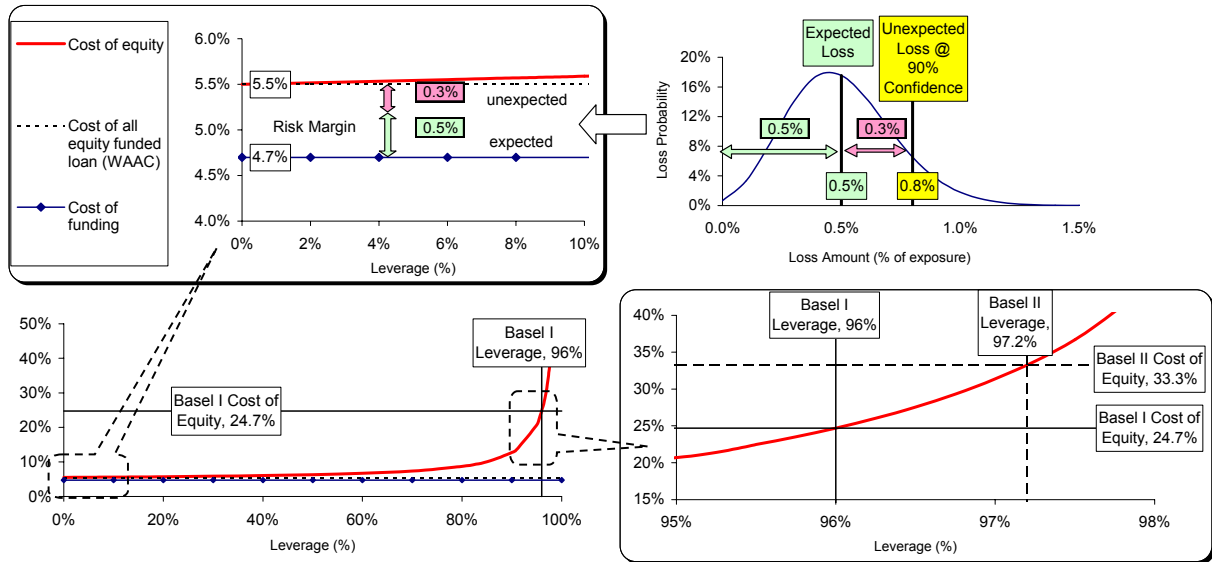


Figure 3: Cost of Capital and Loan Pricing under Modigliani & Miller Proposition II

CONCLUDING REMARKS

Based on the paradigm of Modigliani & Miller (1958), this article has built the argument explaining why lending rates in New Zealand should not actually be affected by the pure change in risk weights for loan most categories as they will come into force under the new Basel II regulatory framework. While traditional capital-charge based pricing methods may still be in the “heads” of many front line bankers, it is clear that rational banks will have loan pricing driven by the fundamental risks of the credit and not by regulatory capital requirements. Basel II reinforces this risk

¹⁰ See Myers (2001) for an overview of more recent research theories regarding the optimal capital structure of non-financial firms.

based pricing philosophy which is not actually new, certainly not to New Zealand. Whilst it has long been the norm in corporate lending, it is now also being applied in retail lending such as mortgages and credit cards. It is a fact that many banks already offer residential mortgages priced in accordance with the risk of the particular borrower, respectively the underlying asset. Obviously, this also opens avenues for arbitrage on the borrower's side which might be able to turn to a bank which views their risk more favourably. In summary, it can be expected that banks will further invest into their risk monitoring systems and that risk-based loan pricing will make further inroads into retail lending, quite independently of how fast Basel II will actually be implemented.

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